

Collection of Blood Specimens

Collection By Venipuncture

Venipuncture is the primary method used for acquiring blood samples for laboratory testing.

Equipment Needed:

Requisitions, Vacutainer tubes, tourniquet, gauze, Vacutainer Eclipse Blood Collection Needle with Pre-attached Holder, gloves, alcohol prep pad, tape or band-aid

Procedure:

- Identify patient. See Patient Identification and Specimen Labeling Policy and Procedure.
- Assemble all necessary equipment.
- Open needle and holder package.

Note: If package is not intact then discard and obtain a fresh needle.

- Insert Vacutainer tube into holder up to the interior needle. Do not push interior needle into tube exterior because of loss of vacuum if needle penetrates tube prematurely. Do not remove needle sheath until ready to perform the venipuncture.
- Apply tourniquet. Locate vein, preferably in anti-cubital fossa area. Cleanse area with alcohol. (see Blood, Fungus Blood and/or AFB Blood culture procedure for patient preparation for those specimens).
- With patient's arm in a downward position, insert needle, with bevel side up, in one continuous motion. Maintain the tube below the venipuncture site throughout the procedure.
- Grasp flange of needle holder and push tube forward until the end of needle punctures stopper.
- Release tourniquet as soon as blood flow is seen.
- Use thumb to maintain slight forward pressure on tube.
- Fill tube until all vacuum is exhausted. Gently remove full tube from needle holder and replace with next tube to be collected.
- Tube collection order is as follows:
 - Yellow fungal cultures
 - Blood Cultures bottles **please read Collection of Blood Cultures in this section**
 - Light-blue top (sodium citrate)
 - Gold top, serum separator (SST)
 - Red top
 - Orange top, serum separator (SST)
 - Green top (sodium heparin or lithium heparin)
 - Pearl top (EDTA)
 - Lavender top (EDTA)
 - Royal-Blue top (EDTA or plain)
 - Grey top (sodium fluoride/potassium oxalate)
 - Yellow top (ACD)

- Five to 7 mL must be drawn for a discard before collection of tubes for testing. NCCLS guidelines suggest

- Gently invert all tubes that contain additives 6 to 8 times to insure proper mixing of the blood with additive.
- When last tube is filled remove needle and holder from patient's arm. Slide needle safety shield over needle. Place needle and holder in biohazard sharps container.
- Apply pressure to puncture site with dry gauze or cotton for 3 to 5 minutes or until bleeding stops and apply band-aid, tape or coban wrap.

Note: For patients on platelet precautions or anti-coagulants, pressure should be held for 10 minutes.

- Immediately label tube per the Patient Identification and Specimen Labeling Policy and Procedure.

Collection by Line Draw

Patient with an intravenous (IV) line:

- If an alternate site cannot be located for venipuncture, the physician or nurse may request that the venipuncture be performed above the IV.
- The nurse or physician should shut off the IV for 3 to 5 minutes while elevating the arm above the chest. (The collector must not shut off the IV. Only the nurse or physician may do this.)

Note: NEVER perform a venipuncture above an IV unless permission is obtained from physician or nurse.

Patient with an indwelling catheter, portacath, or line; the specimen may be collected by the nurse as follows:

- The line must be accessed per nursing protocol.
 - A "needleless" system should be used with the Vacutainer collection set. If a syringe is used, the blood should be safely transferred from the syringe to an evacuated tube. The rubber stopper must not be removed from evacuated tubes. The stopper is pierced with the needle and the tube is allowed to fill (without applying pressure the plunger) until flow ceases. This technique will help to maintain the correct ratio of blood to the tube additive.

"Collection of the blood through lines that have been previously flushed with heparin should be avoided, if

possible. If the blood must be drawn through a VAD (vascular access device), possible heparin contamination and specimen dilution should be considered. In this case the line should be flushed with 5 mL of saline and the first 5 mL of blood or 6 dead space volumes of the VAD discarded.”

- A venipuncture should not be performed on the side of a mastectomy unless ordered by physician or nurse.
- A venipuncture must not be performed on an arm with a fistula or shunt unless directed by the nurse or physician.
- In those situations when an arm or hand vein cannot be accessed, a venipuncture may be performed in the ankle area of the leg. This should not be performed without a physician order. The collector should apply pressure directly to the venipuncture site for a minimum of 10 minutes.

Collection by Fingertick

Capillary access, frequently referred to as fingertick or microcapillary skin puncture, is a procedure used to collect small volumes of blood when a venipuncture procedure fails or when venous access will prove to be very difficult. It is frequently the easiest method of acquiring small volumes of blood from children.

Equipment Needed:

Requisitions, gauze, gloves, alcohol prep pad, tape or band-aid 2x2 gauze pad, lancet, appropriate specimen container, heel warmer

Procedure:

- Identify patient. See Patient Identification and Specimen Labeling Policy and Procedure.
- Assemble all necessary equipment.
- Position the patient with equipment in an appropriate close place to the patient. Select the finger.
- Warm the finger if cold.
- Clean the site with the alcohol prep. Allow to air dry.
- The puncture site should be on the medial or lateral aspect of the planar surface of middle or ring finger. Punctures should be made against the grooves of the fingerprint. Incisions made with the grooves will have the tendency to

run down the finger instead of forming a drop. Puncture should be performed in one continuous motion. Hold finger gently, but firmly, with fingers well away from the puncture site. Hold the lancet firmly against the finger with the trigger accessible to the index finger of the phlebotomist. Firmly press the trigger until the plastic snap sound is heard. Wipe the first drop of blood away with a clean gauze pad.

- Collect specimen by applying moderate pressure, limit squeezing of the finger to minimize patient trauma and to preserve specimen quality. Blood should be allowed to drip into collection tube, avoid scooping. Periodically wipe the site with a clean gauze pad to encourage the formation of round drops. When the bleeding stops apply a dressing.
- Tubes containing anticoagulants should be mixed thoroughly in order to prevent specimen clotting. If the procedure is taking an excessive amount of time the procedure should be stopped, the specimen should be mixed and collection resumed. Discard all used equipment in appropriate containers.
- When the collection is completed, apply a clean gauze pad to the site and apply pressure until the bleeding has stopped.
- When the bleeding stops apply a dressing.
- Immediately label tube per the Patient Identification and Specimen Labeling Policy and Procedure.

Collection by Heel stick

The heel stick method is a collection of a specimen by pricking the skin of the heel and obtaining a small amount of blood. The site should be warm, pink, and free of bruises, scars or rashes. Do not use sites that are cold, edematous or cyanotic. Heelstick is the preferred collection method for obtaining blood specimens for laboratory testing on neonate patients.

Equipment Needed:

Requisitions, gauze, gloves, alcohol prep pad, tape or band-aid 2x2 gauze pad, Tenderfoot collection device, appropriate specimen container, heel warmer

Procedure:

- Identify patient. See Patient Identification and Specimen Labeling Policy and Procedure.
- Assemble all necessary equipment.

- Remove only the clothing that will interfere with the foot being used for sampling, in order to minimize loss of body heat.
- Select a heel.
- Warm the heel if cold. Massage foot gently 5 or 6 times to aid blood flow.
- Clean the site with the alcohol prep. Allow to air dry.
- Remove the Tenderfoot device from the protective wrapper, taking care not to touch the blade site. Remove the trigger guard.
- The puncture site should be on the lateral or medial area of the bottom or plantar surface of the heel (the walking surface).
- DO NOT USE: previous puncture sites, the curvature of the heel, the central area of foot (area of the arch). This may result in injury to nerves, tendons, and cartilage.
- Puncture should be performed in one continuous motion. Hold heel gently, but firmly, with fingers well away from the puncture site. Hold the Tenderfoot firmly against the heel with the trigger accessible to the index finger of the phlebotomist. Firmly press the trigger until the plastic snap sound is heard.
- Wipe the first drop of blood away with a clean gauze pad.
- Collect specimen by applying moderate pressure, limit squeezing of the heel to minimize patient trauma and to preserve specimen quality. Blood should be allowed to drip into collection tube, avoid scooping. Periodically wipe the site with a clean gauze pad to encourage the formation of round drops.
- Tubes containing anticoagulants should be mixed thoroughly in order to prevent specimen clotting. If the procedure is taking an excessive amount of time the procedure should be stopped, the specimen should be mixed and collection resumed.
- When the collection is completed, apply a clean gauze pad to the site and apply pressure until the bleeding has stopped.
- When the bleeding stops apply a dressing.
- Readjust any of the baby's clothing that was displaced to perform testing.
- Immediately label tube per the Patient Identification and Specimen Labeling Policy and Procedure.

Collection of Blood Cultures

Cultures are processed using special media and instrumentation; therefore, it is necessary to submit all blood cultures in the bottles provided by Missouri Baptist Medical Center Laboratory. These cultures are inoculated at the patient's

side. Blood cultures are most often collected 2 sets at a time. An aerobic bottle (green) and an anaerobic bottle (maroon) filled from a single venipuncture constitute 1 set of cultures. Pediatric specimens should be inoculated into a single pediatric (yellow) blood culture bottle.

The timing of blood cultures is usually specified in the physician's orders. If timing is not specified, the usual recommendation is 2 sets of cultures drawn at 15-minute intervals. Another common order is for 2 sets of cultures drawn at the same time from different venipuncture sites. A maximum of 4 sets of blood cultures are allowed in a 24-hour period. Additional blood cultures will be performed only with the approval of the Medical Director of the Laboratory.

Do not use blood culture bottles that are cracked, leaking, or dented. Do not use bottles that are outdated.

Contact the Microbiology Laboratory if the physician has indicated that the blood cultures are to be processed for Subacute Bacterial Endocarditis (SBE), as these cultures require special handling in the Microbiology Laboratory.

Blood for fungal and/or acid-fast bacilli (AFB) should be collected in an Isolator Vacutainer (available from the laboratory) using standard phlebotomy procedure. Fungal and AFB blood cultures cannot be performed on blood that has been placed in routine blood culture bottles.

It is important to document the following information on each bottle collected: date and time of collection, initials of person collecting cultures, amount of blood placed in each bottle, location of collection if other than a peripheral draw (ie, port-a-cath, IV line, etc.) When drawing blood from an indwelling catheter, draw and discard 5 mL prior to withdrawing the blood to be inoculated into the culture bottles.

Collection:

- Wipe rubber tops of blood culture bottles with alcohol prep pad and allow to air dry.
- Select optimal venipuncture site.
- Apply Chloraprep by vigorously scrubbing the skin in a back-and-forth manner with the Chloraprep applicator for 30 seconds.
- Allow Chloraprep to dry for 30 seconds. Do not touch the venipuncture site after skin is prepped. If absolutely necessary, you may palpate the vein just above or just below the venipuncture site, but only after prepping the gloved finger with Chloraprep.

- Apply tourniquet and draw 20 mL of blood with sterile syringe and needle or with a butterfly and adapter set.
- After venipuncture, loosen the tourniquet and apply pressure to site with gauze pad.
- Add 10 mL of blood to each bottle using a blood transfer device. Inoculate the anaerobic (maroon) bottle first. If less than 20 mL has been collected, divide the blood as specified below. Discard needle in a SHARPS container.
- Apply a bandage to the venipuncture site.
- Label the bottles using the Patient Identification and Specimen Labeling Policy and Procedure. Label must include site from which specimen was collected.

Volume:

- <5 years
 - Optimal draw = 1 mL per year of age up to 4 mL
 - Minimal draw = 0.1 mL per bottle
 - Place all blood in yellow pediatric bottle
- >5 years
 - Optimal draw = 10 mL per bottle
 - Minimal draw = 0.1 mL per bottle
 - < 3 mL-place all blood into aerobic (green) bottle
 - >3 mL-divide equally between aerobic (green) and anaerobic (maroon) bottles; inoculating the anaerobic bottle first
 - DO NOT EXCEED 10 mL per bottle

Note: Studies have demonstrated that as the volume of blood cultured is increased from 2 mL to 20 mL, the yield of positive cultures increases by 30% to 50%. A similar direct correlation between volume of blood cultured and recovery rate of clinically significant organisms has been documented. Every attempt should be made to collect 20mL of sample per culture set.